



**Arkansas Public Health Pandemic Working Group
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COVID-19 Forecasts, Projections, and Impact Assessments

The University of Arkansas for Medical Sciences' (UAMS) Fay W. Boozman College of Public Health (COPH) faculty conducted four types of assessments for this month's report: 1) a look at the pandemic in Arkansas from a longer-term perspective; 2) forecasts and projections of cases and maps of community spread; 3) forecast models of hospitalizations; and 4) forecast models of COVID-19 deaths.

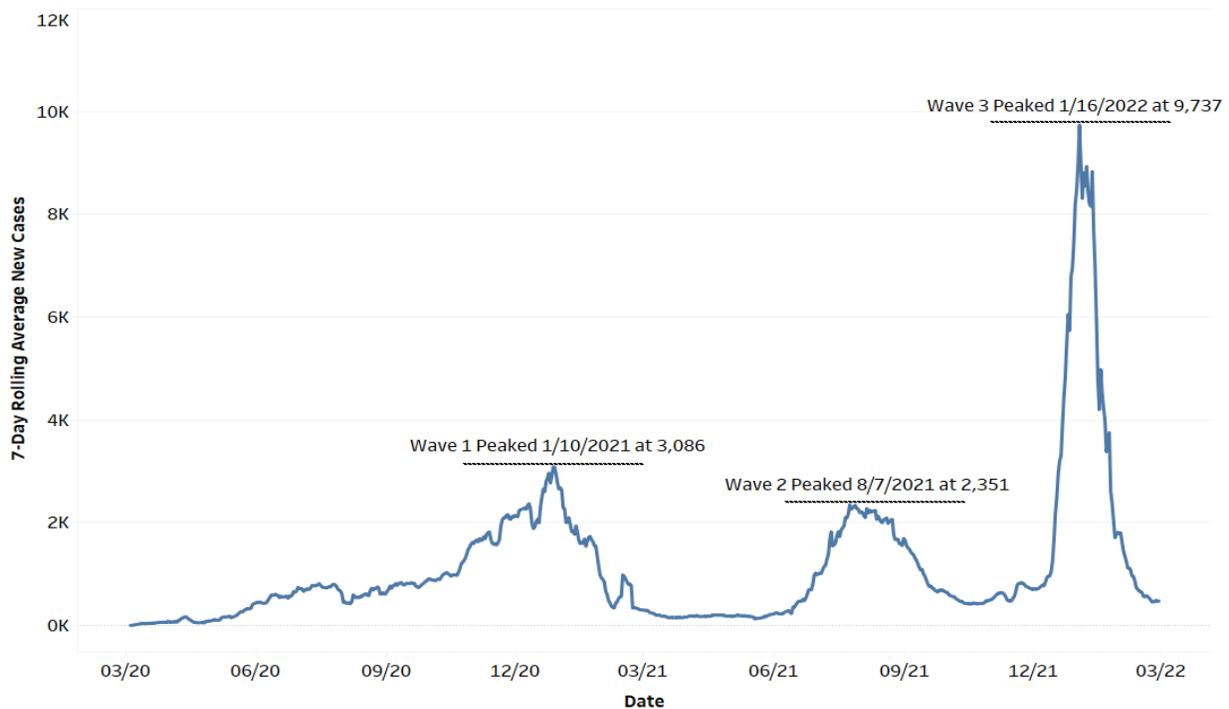
All forecasts and projections were developed using COVID-19 data from the Arkansas Department of Health through March 13.

Quick Facts from the *Report* are:

- The models are forecasting 17,788 new cases by April 12. New daily cases are expected to average 593 per day.
- The 30-day models continue to show Arkansans between ages 35 and 59 will have the highest number of COVID-19 diagnoses — forecast to increase by 5,577 cumulative cases by April 12.
- The models forecast 1,393 new COVID hospitalizations by April 12, averaging 46 per day.
- The 30-day model is forecasting an average of 14 COVID-19 deaths per day for the next two weeks, adding 661 new deaths over the next 30 days, averaging 22 per day.

The models show the number of new cases, hospitalizations, and deaths due to COVID-19 in the next 30 days, compared to one month ago, will continue to be flat.

Figure 1. COVID-19 waves in Arkansas



As shown in Figure 1, the COVID-19 pandemic in Arkansas has followed a wave pattern of infection. The reason for the wave pattern is related to a number of factors, predominantly the infectiousness of the virus and the number of people within a population susceptible to infection at a given time. Both factors are highly variable.

The COVID-19 virus mutates often. Like any virus, almost all COVID mutations are not viable and pose no risks to humans. However, occasionally, a mutation will produce a new variant with the potential to infect more people and/or to make people sicker. Even these may not pose much risk unless they are able to supplant or replace the circulating dominant variant. The dominant variants in Arkansas have been the Alpha, Delta, and Omicron variants. As illustrated in Figure 1, each variant caused a surge in COVID cases, hospitalizations, and deaths. The latest surge, which produced the most cases, hospitalizations, and deaths so far in the pandemic, was due to the Omicron variant. Omicron at its peak infected more than twice as many Arkansans as the Alpha and Delta variants combined.

Immunity to COVID-19 wanes over time. It does not matter whether immunity is induced by vaccination or is naturally acquired. Immunity acquired through vaccination is more predictable and certain. Natural immunity, acquired from having been infected with COVID, varies with the severity of COVID disease. As immunity wanes, whether induced by vaccination or disease, a person becomes more susceptible to a new infection. A person can be repeatedly infected.

In the two years the pandemic has stricken Arkansas, COVID has taught us several valuable lessons, which, if applied, can be used to guide better public health practices. Here are six lessons.

- COVID-19 infections follow a wave pattern. Infections waxed and waned over time. If the wave pattern continues, there will be another surge.
- COVID-19 infection is not seasonal. Infection waves can occur at any time.
- Waves of infection occur because COVID-19 immunity, whether induced by the vaccine or natural, wanes. New waves tend to coincide with immunity waning in a population.

- The COVID-19 vaccine works. The vaccines can prevent infections. More importantly, they are also very good at preventing serious disease, hospitalizations, and deaths. But, immunity must be periodically boosted.
- It is far safer to gain immunity to COVID-19 from the vaccine than from an infection. There is no risk of serious illness, hospitalization, or death from the vaccine.
- The public tends to pay attention to the pandemic when it is surging, as evidenced by the history of COVID testing and vaccine uptake in the state.

Arkansas is facing a new variant and waning population immunity. The new variant has been dubbed Omicron B.2 or the Deltacron variant. Some scientists are calling the variant Deltacron because it has genetic similarities to both the Delta and Omicron variants. Deltacron appears to be more infectious than Omicron. Deltacron infections in Germany, for example, are doubling every week. Hospitalizations are also increasing. In Germany, elderly patients make up much of the increase in hospitalizations because, while a large population of older people were vaccinated, their immunity has waned and they are again highly susceptible to the new variant.

Arkansas is in a pandemic breathing space right now. But, we should expect another surge due to the Deltacron variant. Only about a third of Arkansans have received a booster vaccination. Most who were fully vaccinated completed the two doses early in 2021. These individuals likely have waning immunity. Furthermore, despite a large number of infections during the Omicron surge, natural immunity associated with those infections is also likely waning.

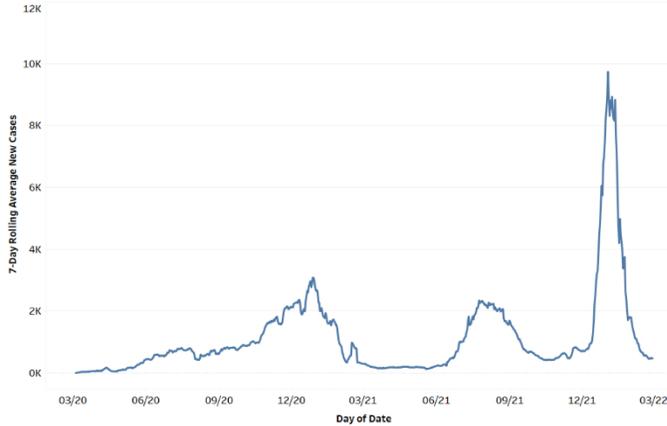
To respond to a new surge, Arkansas should reinvigorate vaccination efforts, particularly in nursing homes and medical practices treating large numbers of geriatric patients. Public health messaging should be in place to give the public easily understandable information about COVID and the benefits of immunization, facemasks, and other prevention measures. The public should also be told about the financial cost of COVID, including missed time from work, medical bills not covered by insurance, reduced retail sales due to self-isolation, and lack of or delayed services due to reduced labor. Colleges and universities should be prepared to suspend classroom teaching in favor of distance learning. Daycare, elementary, and high school programs should have plans in place to reimpose strict CDC recommended infection prevention measures and, if needed, close programs for short periods of time. Hospital systems should be prepared to accept another surge in COVID patients, many of whom, because they will be older, more complex and difficult COVID cases.

Everyone in Arkansas is hoping and to some extent acting like the pandemic is over. Unfortunately, it is not. Arkansans do not need to be at red alert all the time., But, we must be prepared to go back on alert status when circumstances warrant. In the next two to three months, we may need to do so again. The state has had 11,000 COVID deaths in two years. Arkansans should resolve to not add another five to six thousand COVID-19 deaths in the coming year.

The COVID-19 Pandemic in Arkansas

Figure 2 shows the seven-day rolling average of new infections since March 2020. Daily

Figure 2. Seven-day rolling average of daily COVID-19 cases



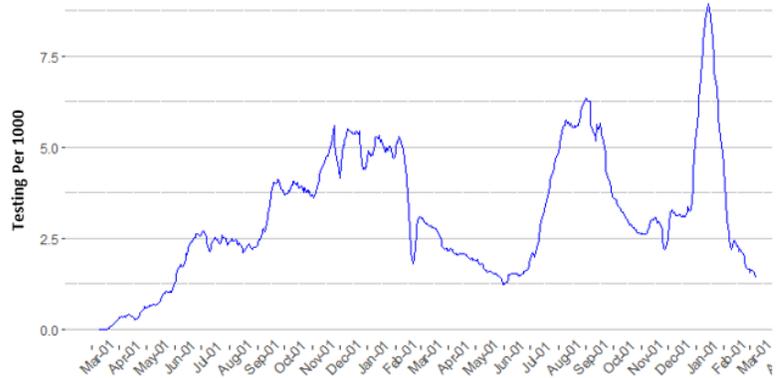
numbers are often considered too “noisy” to accurately reflect an epidemic’s growth. To reduce noise, we use rolling averages to smooth out meaningless daily differences in infections.

What is easily discernable from data plotted in Figure 2 is that Arkansas recently experienced a COVID-19 wave that far exceeded all previous COVID-19 activity in the state. Prior to 2022, the month with the highest average of new daily cases was January 2021, which saw an average of 2,262 cases. In January 2022, the average number of

new daily cases in Arkansas was 6,783. The 7-day rolling average of new daily cases in Arkansas in February dropped to 1,544, and further dropped to 507 in March.

Figure 3a shows the COVID-19 testing rate per 1,000 persons in Arkansas. The testing rate has significantly declined in the last few months. As of March 9, the state performed 1.4 tests per 1,000 persons, which is lower than the national average of 3.3.

Figure 3a. COVID-19 testing rate per 1,000 through March 9



The COVID-19 positivity rate is an indicator of viral

transmission. The positivity rate is the number of people who test positive for COVID-19 as a proportion of the number of people tested. A higher positivity rate is indicative of higher transmission relative to the number of tests. A higher state positivity rate and relatively low testing level raises serious concerns about our ability to know the “true” number of COVID-19

Figure 3b. COVID-19 positivity rates through Mar. 9



cases in the state.

Figure 3b shows the seven-day moving average of positivity rates in Arkansas and the United States. The positivity rates in Arkansas and the U.S. spiked during late January due to the high number of Omicron infections. But, in recent weeks, both state and national positivity rates have declined significantly. The state’s positivity rate currently stands at 3.1%,

which is lower than the national average of 7.1%. Since there is no active surveillance either statewide or nationally, both the per capita testing rate and the positivity rate estimates should be considered extremely conservative.

COVID-19 Cases

PCR tests are the gold standard for identifying COVID-19 cases and probable cases are diagnosed using an antigen test. Antigen test results have been reported by the ADH since Sept. 2, 2020. ADH continues to distinguish between confirmed and probable cases, but they are combined for this report. In the report, confirmed and probable cases are “cases.” For this report, we used data from Feb. 1 to March 13 to ensure greater stability in the models.

Forecasts of COVID-19 cases in

Arkansas. New daily cases for the period March 15 to April 12 are shown in Figure 4a. The 30-day model is forecasting an average of 472 new cases per day for the next 30 days.

Figure 4a. *New Daily COVID-19 cases*

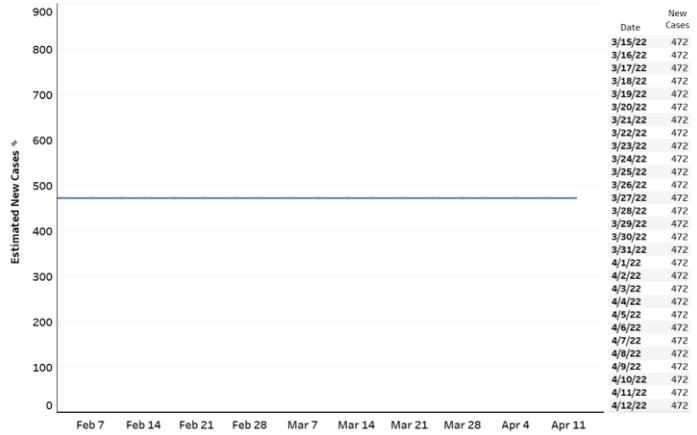


Figure 4b. *Cumulative COVID-19 cases through April 12*

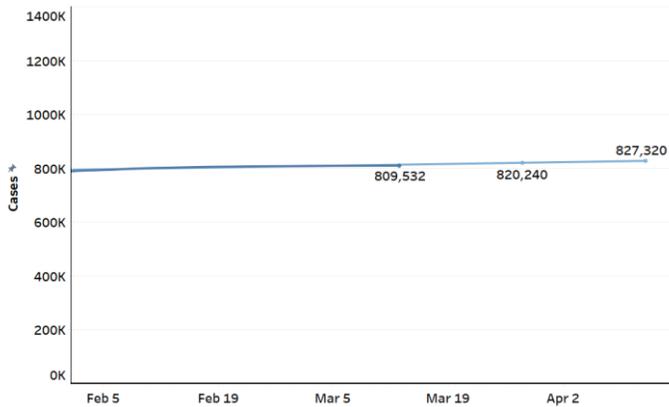


Figure 4b shows the forecast of cumulative COVID-19 cases through April 12. The 30-day cumulative forecast shows Arkansas will reach 827,320 cumulative cases by April 12, a potential increase of 17,788 cases.

Forecasts by age. As shown in Figure 5, the forecast of cumulative cases by age shows slight increases in every age group, with small variations in growth across groups. The lowest

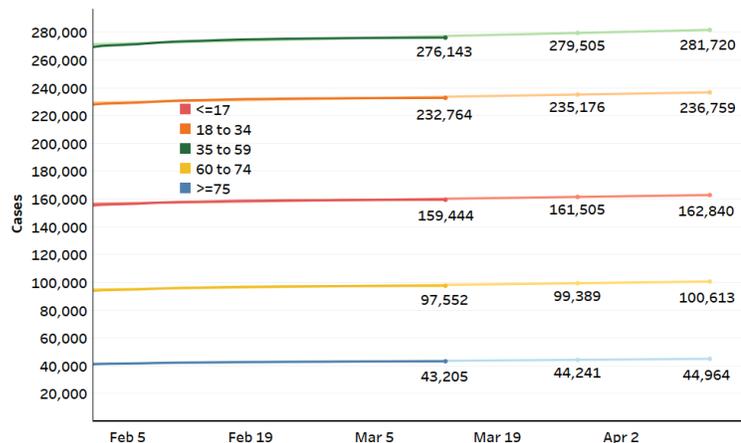
number of cases will continue to be in Arkansans 75 and older.

The age group expected to have the greatest increase in new cases are Arkansans 35 to 59.

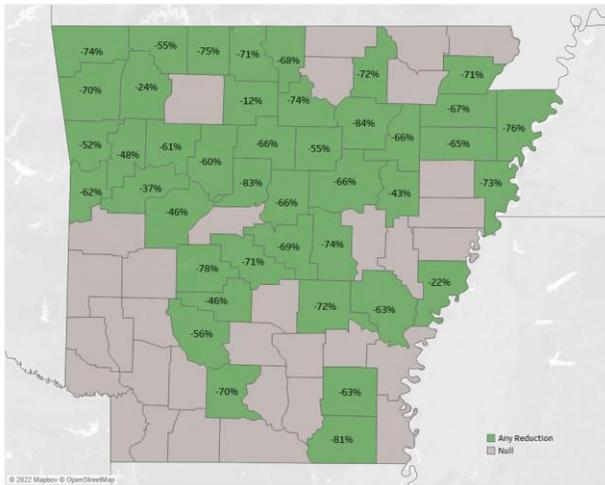
This continues a pattern evident for some time. This age group will have about 5,577 new cases by April 12, averaging 186 new cases per day. The group with the second highest growth will be young adults age 18 to 34. The model is showing an additional 3,995 will contract COVID by April 12. This is an average of 133 new cases per day.

The model forecasts around 3,396 new COVID cases in children 17 and under through April 12, an average of 113 new cases per day.

Figure 5. *Cumulative COVID-19 cases by age through April 12*



Map 1. Relative change in COVID-19 cases



Relative change in COVID-19 cases by county. Map 1 shows the relative change in COVID-19 cases across Arkansas counties in the past two weeks. Relative change is calculated as the percent change between cases during the most recent two-week period (Feb. 28 to March 13) compared to cases from the prior two weeks (Feb. 14 to Feb. 27).

The relative change in cases presents the most definitive pattern we have seen across the state in some time. All counties report reduced relative change rates for the last two weeks. The largest relative decrease in COVID-19 cases was in Independence County (-84%) and the smallest decline was in Searcy County (-12%).

Counties with fewer than 10 cases during the most recent two weeks or the prior two weeks are displayed as “null” and shown in gray.

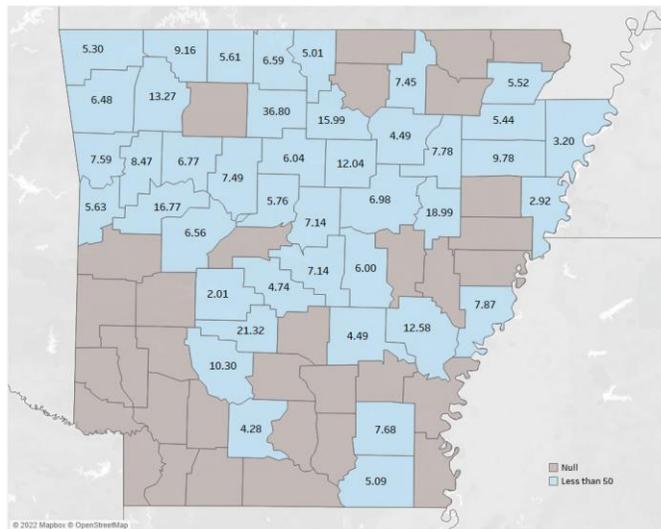
As shown on Map 2, all counties in Arkansas had elevated per capita COVID-19 cases between Feb. 28 and March 13, but at low levels. Per capita case rates ranged from 3 to 37 cases per 10,000 persons. All counties had case rates below 50. Case rates are now similar to what they were in September 2020, before the Delta surge, when only two counties had per capita case rates greater than 30 per 10,000.

Summary. The 30-day models are forecasting a slight decline in new daily COVID-19 cases in Arkansas through March and into April.

The pandemic will continue to impact all age groups, with the highest number of infections being in adults 35 and 59. Young adults 18 to 34 will also experience high rates of new cases.

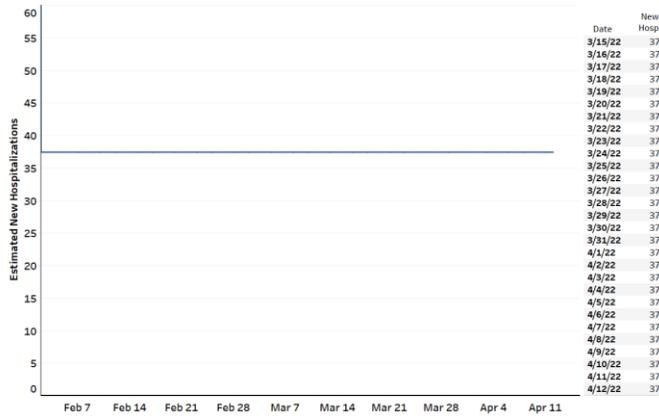
There are no COVID “hotspots” in the state. COVID-19 cases are not localized to any region in Arkansas, with per capita cases declining in every county in the state.

Map 2. COVID-19 two-week per capita case rate



COVID-19 Hospitalizations

Figure 6a. *New daily hospitalizations*



30-day forecasts of hospitalizations.

Figure 6a shows the realized rate of new hospitalizations in Arkansas between Mar. 15 and April 12. As is easily discernible from the figure, hospitalizations have reached a point of apparent equilibrium. Average new hospitalizations per day are expected to be 37 through April 12.

The 30-day forecast for cumulative COVID-19 hospitalizations is shown in Figure 6b. The model forecasts a total of 37,238 cumulative hospitalizations by April 12, an increase of 1,393 patients in

the next month.

Figure 7 shows the 30-day forecast of hospitalizations by age group through April 12. As is evident, hospitalizations in all age groups will increase slightly. For the first time in the pandemic, adults aged 60 to 74 are forecasted to be the age group with the greatest number of hospitalizations, adding 187 new patients in the next 30 days. Adults 35 to 59 will have an estimated 135 newly hospitalized individuals over the next 30 days.

Summary. Hospitalizations will be level over the next month. The models forecast the greatest number of hospitalizations due to COVID-19 will be adults 60 to 74, closely followed by adults 35 to 59.

Figure 6b. *Cumulative hospitalizations through April 12*

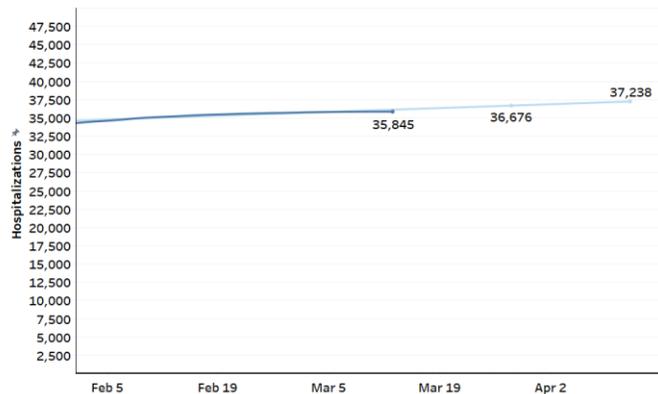
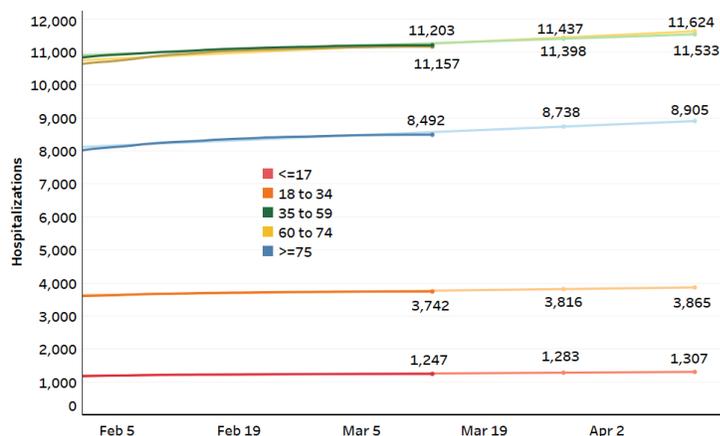


Figure 7. *Cumulative hospitalizations by age group*



COVID-19 Deaths

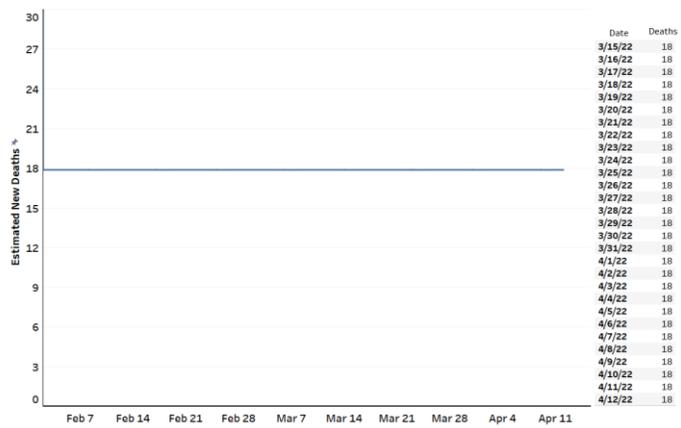
30-day forecast of COVID-19 deaths.

Figure 8a shows the realized rate of new COVID-19 deaths in Arkansas from Feb. 14 to April 12. The model forecasts an average of 18 deaths per day through April 12.

Figure 8b shows the 30-day model forecast 11,103 cumulative deaths in Arkansas due to COVID-19 by April 12. The model is forecasting 661 new COVID-19 deaths over the 30-day forecast.

Summary. The number of daily deaths from COVID-19 appears to be relatively stable at 18 deaths per day, a slight increase from 14 deaths per day in last month's report.

Figure 8a. Daily COVID-19 deaths



Deaths lag both cases and hospitalizations, which suggests the number of deaths should begin to decrease if the trend in cases and hospitalizations continues to decrease.

Figure 8b. Cumulative COVID-19 deaths through April 12

